ADVANCING PATIENT SAFETY AND ENGAGEMENT THROUGH THE USE OF A PATIENT-CENTERED BENZODIAZEPINE EDUCATION TOOLKIT

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Abstract

Background: Substance use disorders have increased in the U.S. in the past 20 years, with opioid abuse causing over 70,000 deaths from 1999 to 2019. The growing public health problem necessitates developing a patient-centered educational toolkit. Patients on benzodiazepines who are at increased risk of morbidity and mortality are not engaged in their benzodiazepine management and need a specific educational tool to provide the necessary knowledge for medication management. In addition, there is currently no patient education to improve benzodiazepine safety or evidence-based program to enhance the partnership between the prescriber and the patient in many offices.

Method/Design: The investigator developed an evidence-based patient education toolkit to enhance patients' knowledge about the safe use of Benzodiazepines and the risks of chronic Benzodiazepine use. Forty-one participants completed a voluntary pre, and post-survey focused on benzodiazepine-related knowledge and willingness to decrease or cease use. This improvement project aimed to (i) educate and improve the patients' understanding of safe

Benzodiazepine use. (ii) Increase patient's readiness to decrease or cease long-term Benzodiazepine use.

Participants: A convenient sample of 41 patients prescribed benzodiazepines at the behavioral health clinic was selected.

Results: Results of linear regression indicated that patients improved their knowledge regarding safe benzodiazepine use after using the patient-centered toolkit. However, no statistically significant changes were observed in patient willingness to decrease or cease benzodiazepine use.

Conclusion: The patient-centered toolkit is useful in improving patient knowledge regarding safe usage of benzodiazepines. However, the toolkit was not beneficial in changing the patients' willingness to cease or decrease benzodiazepine usage. Nevertheless, findings are helpful in nursing practice and should be used to inform current practice. Future investigators should improve the toolkit by completing projects focused on how the toolkit can be made more effective or used in more focused interventions.

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Chapter 1

Introduction

Benzodiazepines are useful in treating various disorders, such as panic and anxiety disorders, insomnia, seizures, and alcohol dependence (Ameline et al., 2019; Kang et al., 2021). Further, benzodiazepines possess psycholeptic, muscle relaxant, sedative, anticonvulsant, and anxiolytic properties, making them helpful in mitigating many adverse health issues (Ameline et al., 2019; Kang et al., 2021). Although Benzodiazepines are beneficial to patient health when used correctly, they can also adversely impact patient health when misused (Kang et al., 2021). Benzodiazepine misuse and abuse can result in many negative consequences, such as overdose, suicide, life-threatening consequences of drug dependence, cognitive decline, car crashes, and legal problems (Liang et al., 2019).

Substance use disorders have increased in the U.S. in the past 20 years, with opioid abuse causing over 70,000 deaths from 1999 to 2019 (National Institute on Drug Abuse, 2021). Given the many benzodiazepine-related overdose deaths in the United States, the growing public health problem necessitates developing a patient-centered educational toolkit. This project focuses on direct care change that aims to improve the knowledge and safety of adult mental health patients taking benzodiazepines. The investigator has developed an evidence-based patient education toolkit to enhance patients' knowledge about the safe use of Benzodiazepines and the risks of chronic Benzodiazepine use. The toolkit will educate patients about safe Benzodiazepine use, possible side-effects, and how to stop Benzodiazepines when ready safely. In addition to educating patients about Benzodiazepine use, the toolkit will create opportunities for patients to share responsibility as a partner to improve their overall quality of life. The project's expected

direct care outcomes are to educate and improve the patients' knowledge of safe Benzodiazepine use and increase their readiness to change by weaning and discontinuing Benzodiazepines.

This first chapter introduces the project. First, a background to the problem, the problem statement, and the project questions are presented. Then, the operational definitions and the need for and significance of the study are discussed. Finally, this chapter concludes with the project's assumptions and limitations.

Background of the Problem

Benzodiazepines belong to the nervous system depressant drug group and work by affecting the brain's neurotransmitters. These drugs are psychoactive, with providers commonly prescribing for anxiety disorders, insomnia, muscle relaxation, seizures, and even alcohol withdrawal (Ghosh et al., 2020). Common names for benzodiazepines include, Ativan, Klonopin, Tranxene, Restoril, Valium, and Xanax. The dangers of combining Benzodiazepine with dangerous substances or high-risk medications are a severe and dangerous concern for many who work with mental health patients who take these drugs. Long-term use and inappropriate Benzodiazepines are associated with a public health crisis such as overdose, suicide, life-threatening consequences of drug dependence, cognitive decline, car crashes, and legal problems (Liang et al., 2019). The risks and complications of benzodiazepine use include paradoxical reaction, increased drowsiness, lack of concentration, decreased interest in normal life activities, and alertness (Rapport et al., 2019). Other effects of long-term use include reduced libido, impaired driving skills, erectile dysfunction (Orriols et al., 2019), depression and disinhibition occurring with cognitive impairment, and behavioral problems (Sakshaug et al., 2017).

In addition to the various dangers of benzodiazepines, benzodiazepines were the most common drug involved in prescription opioid overdose deaths (Cadogan et al., 2018). According to the National Institute on Drug Abuse (2018), the use and misuse of benzodiazepines have contributed substantially to the current opioid overdose epidemic. In addition, the Centers for Disease Control and Prevention (2020) reported benzodiazepines were involved in over 30% of opioid overdose deaths in 2019.

Experts found the trends in the consumption rate of benzodiazepines indicated a growing public health problem (Sakshaug et al., 2017; Torres-Bondia et al., 2020). Further, benzodiazepine overdose deaths have increased at an alarming rate in the past two decades (Torres-Bondia et al., 2020). Statistics showed that benzodiazepine-related overdose deaths increased by more than 400% from 1996 to 2013, with emergency department visits for benzodiazepine overdoses rising by more than 300% from 2004 to 2011 (Bachhuber et al., 2016; Jones & McAninch, 2015).

The theoretical framework that underpins this project is the theory of neuroadaptation. Neuroadaptation is a theory of drug dependence based on mechanisms in the brain that change when a person continually uses and administers drugs (Teesson et al., 2011). The brain adapts to counter the drug's acute actions changing the brain chemistry, and either a within-system or between-system adaptation occurs. The former changes at the site of the drug's activity, and the latter creates changes in other systems triggered by the drug's action (Teesson et al., 2011). Thus, with repeated administration, the brain's chemistry changes and eventually adapts.

However, when drug use is discontinued, the brain's homeostasis becomes disrupted, and the brain must adjust to a lack of drug levels. The disruption creates a need in the brain to protect itself and shut down the pleasure sensors. This shut down can cause drug withdrawal and create

the sensation in the brain that the pleasure is gone (Wise & Koob, 2014). The investigator will use this theory as a lens to view the existing literature, biologically help explain the process of the toolkit and help form the project questions.

Statement of the Problem

The problem this current quality improvement project addressed is that patients on benzodiazepines who are at increased risk of morbidity and mortality are not engaged in their benzodiazepine management and need a specific educational tool to provide the necessary knowledge for medication management. There is currently no patient education to improve benzodiazepine safety or evidence-based program to enhance the partnership between the prescriber and the patient in many offices (Bushnell et al., 2017; Guina & Merrill, 2018). Often the patients see the attempt to wean their benzodiazepines as negative or one-sided (Guina & Merrill, 2018). Through such education, the safe use of benzodiazepines could reduce deaths and addictions in the population. The toolbox presented to correct the problem could become a long-term sustainability plan to minimize benzodiazepine-related mortality and lower the high cost of addiction treatment in the United States.

The purpose of this project was to advance patient safety and engagement by using a patient-centered benzodiazepine education toolkit. The project's expected direct care outcome was to educate and improve the patients' knowledge of safe benzodiazepine use and increase their readiness to change by weaning and discontinuing benzodiazepines. This initial program evaluation helped clarify if the patient education benzodiazepine toolkit improves medication knowledge and willingness to change. Supported in the short term, further studies are required to see if this educational intervention improves patients' long-term knowledge retention. Further, findings may reveal if the toolkit impacts readiness to change and results in decreased morbidity

and mortality for patients who are using benzodiazepines. The PICO for the current project states:

P: Patients prescribed benzodiazepines

I: Patient Education for benzodiazepines toolkit

C: Pre-survey of patient benzodiazepine knowledge and readiness to change (anonymous survey online)

O: Post-survey of patients after educational Toolkit implemented (anonymous survey online)

Project Questions

Q1: Will education of patients on benzodiazepines using the investigator-developed toolkit improve the patient's knowledge of safe benzodiazepine use?

Q2: Will education of patients on benzodiazepines using the investigator-developed toolkit increase a patient's readiness to change by successfully weaning off after long-term benzodiazepine use?

Hypotheses

$H1_0$: The education of patients on benzodiazepines using the investigator-developed toolkit will not improve the patient's knowledge of safe benzodiazepine use.

$H1_a$: The education of patients on benzodiazepines using the investigator developed toolkit will improve the patient's knowledge of safe benzodiazepine use

$H2_0$: The education of patients on benzodiazepines using the investigator-developed toolkit will not increase a patient's readiness to change by successfully weaning off after long-term benzodiazepine use.

$H2_a$: The education of patients on benzodiazepines using the investigator-developed toolkit will increase a patient's readiness to change by successfully weaning off after long-term benzodiazepine use.

Operational Definitions

The following operational terms are defined in this section:

The Educational Benzodiazepine Toolkit. The investigator has developed an evidence-based patient education Toolkit to enhance patients' knowledge about the safe use of Benzodiazepines and the risks of chronic Benzodiazepine use.

Patient Increased Readiness to Change Use of Benzodiazepines. The patient's increased readiness to wean off long-term benzodiazepine use was measured through a pre and post online survey (Appendix C). The surveys were used to test the participant's knowledge of the risks and side effects of benzodiazepines to determine the readiness to stop using benzodiazepines. The investigator added the responses to the survey before and after implementing the toolkit to determine if patient scores improved. Improved scores would indicate an increased knowledge of benzodiazepine usage and an increased willingness to change.

Patient's Improved Knowledge on Benzodiazepines. The patient's improved knowledge was measured through a pre and post online survey (Appendix C). The surveys test the participant's knowledge of the risks and side effects of benzodiazepines. The surveys also examined the participant's knowledge and experiences with safety issues, such as alcohol and other medication use while taking benzodiazepines, and determine what impacts the use of benzodiazepines. The investigator added up the responses to the survey before and after

education to determine if the score improved, which would evaluate the patient's improved knowledge on the use of benzodiazepines.

The variables used in the current project, with their respective descriptions, are shown in Table 1.

Table 1
Variables & Descriptions

Variable	Description
Independent variable	Educational benzodiazepine toolkit
Dependent variable	Patient increased readiness to change
Dependent variable	Patients improved knowledge of benzodiazepines

Definition of Terms

The following key terms are defined in this section:

Benzodiazepine. Benzodiazepines are a class of heterocyclic organic compounds that a patient takes as a tranquilizer (Guina & Merrill, 2018).

Drug Addiction. Drug addiction is a persistent condition in which a person continues a cycle of reverting drug dependence, recovering, and returning to dependency (National Institute on Drug Abuse, 2021). Drug addiction is considered a mental illness and a complicated brain disorder (National Institute on Drug Abuse, 2021).

High-Risk Medications. High-risk medications are defined as pharmaceuticals that have a potential for harmful consequences to a person while being highly sought after (Nguyen et al., 2017).

Medication Management. Medication management is defined as a process of overseeing and monitoring the use of medications prescribed to ensure a person is taking their drugs as prescribed and planned so to achieve the potentially determined outcome (Cadel et al., 2021).

Patient Education. Patient education is the practice of information sharing with patients regarding their health, treatment planning, potential outcomes, and wellness (Rooney et al., 2021).

Need for the Study

The existing literature on patient education and benzodiazepines examined patient empowerment intervention, deprescribing benzodiazepines (Gnjidic et al., 2019; Reeve et al., 2017). Experts discussed the potential benefits and harms following the barriers to and enablers of deprescribing (Reeve et al., 2017; Silberman et al., 2020). The potential patient harm from benzodiazepines withdrawal was shown to be dangerous, but explanations for improvement of patient outcomes were limited (Carr et al., 2019; Gnjidic et al., 2019; Ng et al., 2018; Silberman et al., 2020). Information on mitigating adverse patient outcomes because of withdrawal from benzodiazepines is essential for providers who prescribe benzodiazepines because the need to deprescribe safely must be addressed.

Current research focuses more on the use and overuse of benzodiazepines from healthcare providers' perspectives but fails to include discussions on the importance of deprescribing and assistive withdrawal for patients needing to stop using their benzodiazepines (Carr et al., 2019; Rosenbaum, 2020). In addition, further research discussed the need for providers' support when helping their patients discontinue such drug use. Yet, these studies fail to present the means to do so, thereby making the current study applicable Toolkits for the education necessary ((Carr et al., 2019; Gnjidic et al., 2019; Ng et al., 2018).

Experts found a need to examine the process of deprescribing Benzodiazepine for older patients, admitting to the danger of safety, dependence, and misuse of benzodiazepines (Carr et al., 2019; Silberman et al., 2020). In addition, studies observing the use of benzodiazepines in

patients with a mental illness presented findings on such information as patterns of use, development of addictive behaviors, propensity for misuse and abuse, long-term characteristics from drug use, and the incidences of negative behaviors due to long-term use (Bernard et al., 2018; Guina & Merrill, 2018; Maust et al., 2018; Taipale et al., 2020).

With the increase in benzodiazepines, there is a significant need to discuss the means for providing education to patients who are prescribed such addicting medication. The safe use of Benzodiazepine could reduce deaths and addictions in the population (Carr et al., 2019; Ng et al., 2018; Taipale et al., 2020). Thus, implementing this toolkit could be a long-term sustainability plan to minimize benzodiazepine-related mortality. Finally, the use of the toolkit could lower the high cost of addiction treatment in the United States.

Significance of the Problem

The findings of this current project are expected to present significant information for nursing and for mental health professionals, particularly those who work with patients taking benzodiazepines. As healthcare providers continue to decrease the widespread use of prescription abuse, the toolkit could be helpful. The implementation of the benzodiazepine toolkit has excellent potential to provide education to patients needing to stop the use of benzodiazepines and increase knowledge of those who need to continue or begin medication treatment through the use of benzodiazepines. The investigator hopes to share the outcome of this initial program evaluation with providers and patients. In addition, the results will add to the existing literature on the management of benzodiazepine usage, providing much-needed information.

Assumptions

In research, assumptions are defined as those statements presumed to be accurate or plausible that need to be accepted for the findings to have meaning (Wolgemuth et al., 2018).

The most notable assumption is that all participants provided honest and truthful responses, which bolsters the overall project's validity and credibility. For the current project, the investigator assumes all experiences shared by the participants through the survey answers provided trustworthy and reliable information. Additionally, there is an assumption that the participants were forthright in their benzodiazepine use and dependency level.

The investigator also assumes that there will be a significant cause and effect between the listed variables. The assumption of cause and effect is based on applying the independent variable of education through the toolkit and changing the dependent variables of the patient's increased readiness to change and improved knowledge of benzodiazepines. This assumption is made based on the scores produced in the pre and post-surveys.

Limitations

Limitations are unavoidable consequences in a project that impacts data analysis results (Ross & Bibler Zaidi, 2019). The investigator has no control over the limitations and, therefore, will present these. The first limitation is the sample size. Due to time constraints on the project, the investigator only sampled a limited number of 41 participants. Another limitation is the generalizability of the findings, which was limited due to the smaller sample size. A third limitation is the location of the study, as the participants were drawn from a single mental health clinic.

Summary of the Problem

Chapter one discussed the methods and processes used for the current project through an implemented and investigator-developed toolkit used for educational purposes. The investigator's implementation of this patient-centered toolkit provided education focusing on mental health patients regarding benzodiazepine use. This first chapter explained how the investigator would

assist in sharing the benefits and dangers of benzodiazepines and provide information on how to avoid adverse effects from such use. The toolkit's potential use allowed the patent to share medication management responsibility as a partner in their care and improve their safety.

Chapter two presents a comprehensive review of the literature. Then, Chapter 3 presents the methodology. Finally, the data analysis findings are contained in Chapter 4, and a conclusion, summary, and recommendations for future practice are presented in Chapter 5.

Chapter 2

Literature Review

The general problem addressed in this quality improvement project was that patients on benzodiazepines are at increased risk of morbidity and mortality, are not engaged in their benzodiazepines management, and need a specific educational tool to provide the necessary knowledge for medication management. There is currently no patient education to improve benzodiazepines safety or evidence-based program to enhance the partnership between the prescriber and the patient in many offices (Bushnell et al., 2017; Guina & Merrill, 2018). The purpose of this project was to advance patient safety and engagement by using a patient-centered benzodiazepines education toolkit. The project's expected direct care outcome was to educate and improve patient knowledge of safe benzodiazepine use. Furthermore, the project focused on increasing patients' readiness to change benzodiazepines use by weaning and discontinuing benzodiazepines. This chapter presented a synthesis of existing literature that discussed topics related to benzodiazepines use and safety.

Search Strategy

The investigator searched for existing literature in the following databases: CINAHL, CHBD, the Cochrane Library, EMBASE, Global Health, Google Scholar, MEDLINE, PubMed, and Science Direct. The terms and phrases used to search these databases for existing and current literature included alternative treatments instead of benzodiazepine prescriptions, benzodiazepine abuse, benzodiazepine use, benzodiazepine withdrawal, challenges and barriers of managing benzodiazepines dependence, deprescribing benzodiazepines, deprescribing education, deprescribing interventions, deprescribing methods, discontinuation of benzodiazepines, education on benzodiazepines, long-term effects of benzodiazepines, misuse of benzodiazepines,

prescribed beneficial use of benzodiazepines, reasons for benzodiazepine use, and risks with benzodiazepines. In addition, reviewed literature had to meet the following criteria to be selected for this chapter; a) published peer-review work, b) more than 85% of literature selected published after 2017, c) must discuss the topic of interest, and d) must be written or translated in English. The initial number of resources found was over 5,000 scholarly articles, books, government documents, dissertations, and conference proceeding papers. After reviewing the titles, the abstracts, and the content, 61 resources were used for the current chapter's review.

Organization of the Chapter

The chapter was organized, first introducing the theoretical framework and discussing its development, history, and application to the current project. This section is followed with the selected relevant studies, including research resources organized by the following themes: the history and usage of benzodiazepines, recent changes in education on benzodiazepines, preferences for alternative therapies to benzodiazepines, challenges and barriers of pharmacologic management for benzodiazepines dependence, withdrawal, and discontinuation, the deprescribing medication methods, and use of a toolkit for deprescribing medications. Finally, the chapter ends with a section on how the problem was established and has been addressed in previous literature.

Theoretical Framework

The theoretical framework that underpinned this project was the theory of neuroadaptation. Neuroadaptation is a theory that posits drug dependence, and this dependence is based on mechanisms in the brain that change when a person continually uses and administers drugs (Teesson et al., 2011). The brain adapts to counter the drug's binding actions changing the brain chemistry, and either a within-system or between-system adaptation occurs. The former

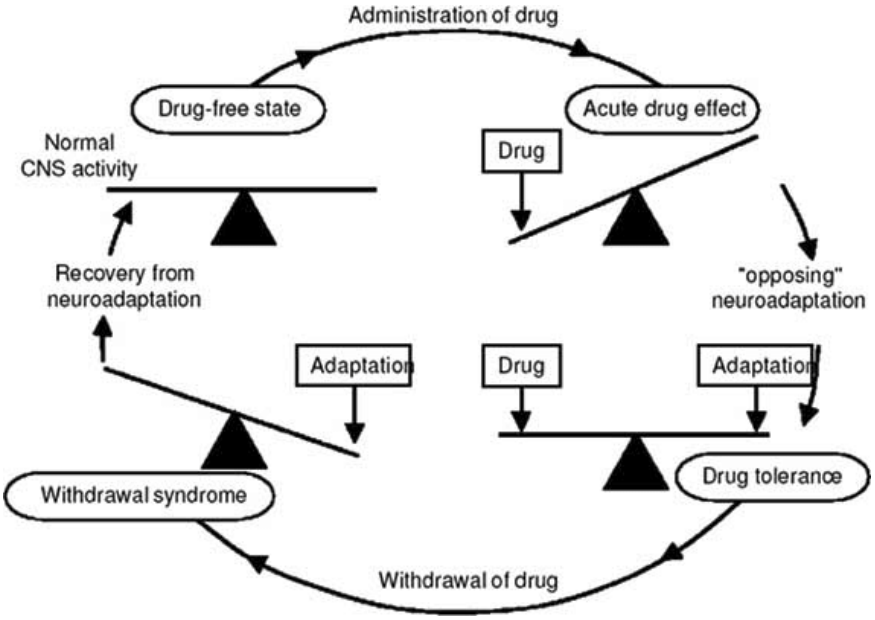
changes at the site of the drug's activity, and the latter creates changes in other systems triggered by the drug's action (Fronk et al., 2018). Thus, with repeated administration, the brain's chemistry changes and eventually adapts.

The theory of neuroadaptation includes addiction models, such as the moral model, disease model, psycho-dynamic model, social learning model, socio-cultural model, and public health model. The current project used the disease model to observe the assumptions that the origins of addiction lie within the individual. Expert examination of addictions showed that an individual addicted to a substance may lose control after their intake. Based on the neurobiology of their brain, addicted people have no control once this substance enters their biological system (Elman & Borsook, 2016; Volkow et al., 2019). The brain adapts to the increased intake of the substance and, again, based on the brain's biological make-up, will prompt an addiction that was not curable. Addiction is a disease that proves irreversible; there is no cure and can only be controlled and treated through lifelong abstinence (Heather et al., 2018; Mollick & Kober, 2020). Experts who support this theory then suggested that addiction does not exist on a continuum; it is either present or is not (Nagy et al., 2005; Volkow et al., 2019).

The administration of a drug causes an acute drug effect which triggers the brain's neuroadaptation. Figure 1 shows this cyclical process through both the administration of the drug process and the withdrawal process. The process is constant with occurrences and discontinuation of drug use and continues with an individual's choices regarding the use of the substance.

Figure 1

Process of Neuroadaptation with Substance Dependence



Note: (Nagy et al., 2005)

The theory of neuroadaptation contends that with the brain's homeostasis becoming disrupted, the brain triggers a stasis that adjusts to the lack of drug levels, creating a need in the brain for protection which in turn shuts down the pleasure sensors first initiated by the consumption of the substance (Wise & Koob, 2014). As the current investigative project focuses on creating a toolkit to assist professionals with patient safety and engagement for prescribing and deprescribing benzodiazepines, this theory was used as the lens for reviewing existing literature and explaining the biological process of the toolkit.

Review of Relevant Literature

The existing literature reviewed for the current project provided insight into what experts and researchers regarded as important when considering themes central to this topic. Information provided in the following sections summarizes findings of current literature focused on patients' using and abusing benzodiazepines. Additionally, information is provided on deprescribing addictive pharmaceuticals, such as benzodiazepines.

History and Usage of Benzodiazepines

Benzodiazepines are often prescribed to sedate or calm a person by raising the level of the inhibitory neurotransmitter GABA in the brain (Cadogan et al., 2018). Common benzodiazepines include diazepam (Valium), alprazolam (Xanax), and clonazepam (Klonopin), among others (Hirschtritt et al., 2021; Silberman et al., 2020). Benzodiazepines were recognized as the most prescribed but most misused and abused sedative-hypnotics parallel with opioids (Fluyau et al., 2018; Kang et al., 2020). Benzodiazepines are commonly prescribed for both short and long-term use (Guina & Merrill, 2018). While these sedative-hypnotics can provide rapid relief for symptoms like anxiety and insomnia, they are also linked to various adverse effects (Guina & Merrill, 2018; Sanabria et al., 2021).

Benzodiazepine use with or without opioid use was found to have an independent risk factor for all-cause mortality. Additionally, Benzodiazepines are directly associated with underlying conditions related to death. Experts agree that the long-term use of benzodiazepines can cause the same symptoms and effects as alcohol addiction (Bogunovic & Greenfield, 2004).

Tolerance may develop with a risk of dependence, and a withdrawal syndrome may occur when discontinuing use. In examining the risks of Benzodiazepines, experts found a high prevalence prescribed to persons over 65 years of age (Bogunovic & Greenfield, 2004; Tannenbaum, 2015). Existing literature showed the examination of such reasons for prescribing benzodiazepines to this population was based on several indications, such as those in an elderly age bracket were most likely to be diagnosed with the condition that benzodiazepines provide relief (Singh & Sarkar, 2016; Tannenbaum, 2015). The most common conditions included generalized anxiety disorder, adjustment disorder, anxiety, and insomnia. However, benzodiazepines were also the first pharmaceutical prescribed to patients with multiple

concurrent physical and psychological problems. Benzodiazepines were also found to be prescribed for an assortment of nonspecific symptoms, such as pallor, headache, malaise, and dizziness. Another common reason providers were prescribing benzodiazepines in the elderly was to relieve the anxiety associated with isolation following bereavement (Singh & Sarkar, 2016).

Even with previous research focusing on the correlations between benzodiazepines and mortality, other experts suggested that the link between benzodiazepines and mortality was small and insignificant. Researchers claiming residual confounding explained the slight increase in mortality risk observed with benzodiazepine use which should not be overtly concerning (Kaufmann et al., 2017). Whereas benzodiazepine and opioid cotreatment were further found as increased long-term mortality risk, experts agreed that targeted interventions were necessary to decrease overprescribing (Park et al., 2020; Patorno et al., 2017; Torres Bondia et al., 2020). However, there continues to be a lack of tools, methods, and education to support the deprescribing of benzodiazepines.

Recent Changes in Education on Benzodiazepines

Early literature on the addiction proclivity of benzodiazepines seemed reassuring, with the suggestion that these prescribed pharmaceuticals were not strong reinforcers and were less likely than others to be misused drugs (Ameline et al., 2019; Rosenbaum, 2020). Much of this research discussed the However, later research found a risk in prescribing benzodiazepines with findings proving benzodiazepines did inadvertently induce a substance use disorder (Mokhar et al., 2020; Schepis et al., 2019). Many studies showed benzodiazepines emerged as a commonly chosen prescribed drug for psychiatric conditions such as the clinical management of sleep disorders and anxiety (Arora et al., 2020; Kaufmann et al., 2017). However, they were unaware

that the long-term effects of these prescriptions did more harm than good. Furthermore, recent research showed that benzodiazepines, like opioids, were addictive substances that caused many patients' abuse and misuse (Bernard et al., 2018; Carr et al., 2019).

In the past, research focused more on the use of benzodiazepines from healthcare providers' perspectives, failing to include discussions on the importance of deprescribing and assistive withdrawal for patients needing to stop using their benzodiazepines (Carr et al., 2019; Rosenbaum, 2020). More recently, researchers found that such reasons for the current misuse of benzodiazepines were primarily based on a lack of education available. Such previous research provided information only on the widely prescribed beneficial use of benzodiazepines to treat patients diagnosed with such conditions as obsessive-compulsive disorder (OCD), post-traumatic stress disorder (PTSD), anxiety, or sleep disorders (Arora et al., 2020; Kaufmann et al., 2017).

Results of double-blind studies with clonazepam were controversial, with researchers performing an open trial with alprazolam that did not support the efficacy of benzodiazepines for OCD or anxiety symptoms (Dell'Osso et al., 2015). In addition, other studies showed the use of benzodiazepines for OCD increased side effects that worsened OCD behaviors (Kang et al., 2020; Mokhar et al., 2020). Based on such adverse outcomes, a few researchers did not recommend considering these conditions with benzodiazepines (Kaufmann et al., 2017; Maust et al., 2018). However, due to limited evidence of the negative efficacy of benzodiazepine use, many providers continued to prescribe these pharmaceuticals, considering them adjunctive therapy for patients diagnosed with OCD (Guina & Merrill, 2018; Miller et al. 2020).

Providers were made aware that certain recent advances in the synthetic chemistry of benzodiazepines enable the synthesis with desired substitution pattern allowing for the medicinal chemistry of benzodiazepines as therapeutic candidates with a good biological profile, including

insight into mechanistic studies (Arora et al., 2020). The correlation of biological data with the structure and the structure-activity relationship studies was also included to provide an insight into the rational design of more active agents (Silberman et al., 2020). Experts claimed that giving a patient-educational booklet during hospitalization may encourage patients to discuss the review and possible deprescribing of benzodiazepine therapy with their health professionals (Gnjidic et al., 2019; Silberman et al., 2020; Taipale et al., 2020). The application of such education for both healthcare providers and patients would prove advantageous and possibly eliminate the abuse of benzodiazepines in the future.

Preferences for Alternative Therapies to Benzodiazepine

Researchers examined the use of benzodiazepines in patients with mental illnesses. They presented findings on information that included patterns of use, development of addictive behaviors, propensity for misuse and abuse, long-term characteristics from drug use, and the incidences of negative behaviors due to long-term use (Guina & Merrill, 2018; Sake et al., 2019; Taipale et al., 2020). In addition, experts examined the long-term use of benzodiazepines and the adoption of alternative behavioral therapies that were useful when successfully developing strategies to treat such disorders as anxiety and OCD (Osler & Jorgensen, 2020; Platt et al., 2018).

Experts suggested that finding alternative therapies for treating anxiety and mood or sleep disorders could alleviate the use of benzodiazepine and its addictive qualities (Maust et al., 2018; Osler & Jorgensen, 2020). The nonpharmacological method as an alternative to benzodiazepine drugs for treating psychiatric disorders and conditions produced positive outcomes. Platt et al. (2018) showed how outcomes were established through such treatments using yoga, meditation, and mindfulness. According to the authors, based on the successful outcomes from these three

methods, providers were less likely to prescribe benzodiazepines for anxiety disorders, PTSD, and specific phobias (Platt et al., 2018).

Based on the reported preferences of benzodiazepine users, experts found providers supported the development and evaluation of nonpharmacological options with collaborative services to improve the uptake of behavioral therapies as an alternative to benzodiazepines was recommended (Maust et al., 2018; Sake et al., 2019). Recognizing other options for individual interventions by practitioners instead of prescribing benzodiazepines only occurs with education on long-term effects and only with the advent of optional treatments. Researchers recommend that future research focus on more alternatives to the use of benzodiazepines and thereby avoiding long-term issues and addiction (Sake et al., 2019).

Pharmacologic Management for Benzodiazepines Dependence, Withdrawal, and Discontinuation

There are many challenges and barriers to the management of medication treatment when prescribing benzodiazepines. The research related to benzodiazepine use was mixed with some experts finding it appropriate and safe to prescribe such drugs to patients with psychological disorders claiming there was a lack of evidence to prove the use of benzodiazepines was unsafe (Patorno et al., 2017; Xu et al., 2020). These experts also claimed that while benzodiazepines were addictive, close monitoring provided the safety features necessary for such treatment (Boggs et al., 2020; Liang & Shi, 2019). Other experts, however, felt that long-term use of benzodiazepine was more harmful than helpful even with close monitoring (Bushnell et al., 2017; Sakshaug et al., 2017). Some examples of these problems included cognitive decline, increased fall risk, and suicide ideation, along with dependence.

Results from an examination of benzodiazepines' long-term effects on patients suggested that cumulative use might be neuroprotective (Boggs et al., 2020; Liang & Shi, 2019). Even so, experts' claims that benzodiazepines contributed to cognitive decline were not proven when outcomes were accounted for use by indication (Picton et al., 2018; Sakshaug et al., 2017). With treatment, altered cognition was suggested due to extended exposure to benzodiazepines; however, there are mixed findings associated with benzodiazepine therapy. Such treatment challenge was found when recent results exhibited that depression, often associated with anxiety managed in part by benzodiazepines, was considered a risk for and often a precursor of dementia (Singh Manoux et al., 2017; Song et al., 2020). In addition, studies showed that the trajectory of depressive symptoms was aggravated when benzodiazepines were used long-term in patients (Singh Manoux et al., 2017).

Fall risk was increased in older patients when prescribed a benzodiazepine; however, the association between the elimination half-life of benzodiazepines and the difference between benzodiazepines and non-benzodiazepines was not clear (Hart et al., 2020; Masudo et al., 2019; Ng et al., 2018). Studies showed one in every ten falls resulting in emergency room visits were due to medication association (Hart et al., 2020; Masudo et al., 2019). The most noted medication causing falls was benzodiazepines. The use of benzodiazepines, often combined with other medicines, impacts the tendency for car accidents and hip fractures leading to hospitalization and potentially death, increasing the risk of falls.

Studies have also shown a strong association between suicide death and poor use of benzodiazepine treatment guidelines. Benzodiazepines have been linked with suicidal ideation, showing a high occurrence of recent benzodiazepine exposure, especially among women, people with mental health issues, and people with physical health problems (Cato et al., 2019; Ghosh et

al., 2020; Schepis et al., 2019). Cato et al. (2019) examined the potential that benzodiazepines were associated with suicide. A sample of 154 patients who had committed suicide was used to ascertain this connection. The authors found benzodiazepines were prescribed to more than 70% of these suicides; however, the results were interpreted in two ways (Cato et al., 2019). The association between benzodiazepines and suicide may have increased only because the patients were already at an increased risk for suicide based on anxiety, depression, and insomnia. However, benzodiazepines may also increase the risk of suicide as many suicide attempts occur because of benzodiazepine overdose (Cato et al., 2019).

Ghosh et al. (2020) assessed the epidemiology of suicide in benzodiazepine patients. They examined the direct association of benzodiazepine use with suicide ideation in a sample of 3465 suicide deaths. The authors found benzodiazepine exposure was more common in those suicide victims who were female versus male, with 50% of the overall sample taking a benzodiazepine through prescription (Ghosh et al., 2020). The final assessment indicated a relatively high prevalence of recent benzodiazepine exposure, which warrants further investigation from clinical and public health perspectives. Common research findings suggested that benzodiazepines caused increased multiple risks (Cato et al., 2019; Ghosh et al., 2020; Hart et al., 2020). In addition, the research cited from these experts suggested that using benzodiazepines was challenging and induced such barriers that caused further problems beyond the condition the patient was being treated (Liang & Shi, 2019; Sakshaug et al., 2017).

Deprescribing Medication

Deprescribing is a method of intervention used intentionally to stop or reduce an individual's medication consumption (Todd et al., 2018). Typically, deprescribing is used on individuals with multiple comorbidities prescribed multiple medications that do not improve

well-being or health. In addition, the use of five or more prescribed medications, called polypharmacy, contributes to an increased risk of adverse events. Thus, the individual benefits from a reduction in the amount of medication taken.

Providers use deprescribing to reduce medication burden and harm, with an overall goal of maintaining or improving their quality of life (Farrell & Mangin, 2019; Isenor et al., 2021). Experts reviewed polypharmacy in different populations, with many finding patients exhibiting manifestations from an adverse pharmaceutical reaction (Hall-Tierney et al., 2019; Wu et al., 2021). Further examinations proved that drug-induced symptoms such as increased and frequent falls, confusion, or signs of frailty resulted from the use of multiple drugs in a single patient.

Often prescribed medication does more harm than good and necessitates the supervised process of stopping the use of a medication internationally. This process was called deprescribing, and healthcare experts often recommend patients cease taking medication completely, while others claim that a medication reduction should occur slowly over time (Isenor et al., 2021; Wu et al., 2021). Studies showed that polypharmacy is highly significant with the increased risks of adverse events from medication interactions, including falls, cognitive deficits, and addiction (Isenor et al., 2021; Langford et al., 2021). The main recommendation from providers with such occurrences was to target a medication and deprescribe to create necessary changes in health outcomes from taking fewer medications. Deprescribing's goal is to reduce medication burden and maintain or improve quality of life.

Long-term tolerance of medication does not necessarily suggest that taking such a remedy is an appropriate treatment. Research showed that the reviewing of a medication regimen for any given patient, a provider must first observe if increased issues have occurred and if so, the provider should recognize the need for medication discontinuation as it may no longer be

necessary (Isenor et al., 2021; Liang & Shi, 2019; Nguyen et al., 2017). Experts found a need to examine the process of deprescribing benzodiazepine for older patients, admitting to the danger of safety, dependence, and misuse of benzodiazepines (Langford et al., 2021; Lumish et al., 2017). Findings showed providers were unclear regarding methods of deprescribing as the limited education on this topic was not readily available (Todd et al., 2018). In addition, studies showed that medication management for deprescribing benzodiazepines was unreliable and created more problems with both health and mental well-being (Cadel et al., 2021).

With the increase in drug overdose deaths involving benzodiazepines and prescription opioids, prescription drug monitoring programs were recommended (Liang & Shi, 2019; Nguyen et al., 2017). However, many of these programs were found to have issues with the execution and maintenance of deprescribing. Many providers were found to have more patients who remain addicted to benzodiazepines than not (Langford et al., 2021; Lumish et al., 2017; McGrath et al., 2017). Many of the current research provided an expert opinion that programs for deprescribing were necessary, but few programs had similarities in their methods. The limited research on methods of deprescribing requires further investigation and necessitates a toolkit for its intervention.

Methods and Interventions for Deprescribing

There is no one 'gold standard' for deprescribing. Experts who examined interventions for deprescribing medications in patients with polypharmacy found patient education was essential but with limited positive results (Gnjidic et al., 2019; Reeve et al., 2017). Gnjidic et al. (2019) conducted a feasibility intervention study to provide patient education using a booklet that offered patient-empowerment education on benzodiazepines and promoted deprescribing for patients over 65 years. The author's goal was to calculate the viability and impact patient

empowerment had for patients admitted to a local hospital whose prescriptions included benzodiazepines (Gnjidic et al., 2019). Evidence showed discussion about deprescribing benzodiazepines versus usual care was provided to the patients. However, most patients simply allowed the provider to implement with little to no questions or instructions. Cessation of benzodiazepines occurred for most patients at one month following discharge. The researchers suggested that future research should provide substantiated effectiveness with using a patient-empowerment booklet to reduce inappropriate medication use (Gnjidic et al., 2019).

Reeve et al. (2017) claimed processes of deprescribing inappropriate medication varied by healthcare provider supervising, yet there were no consistencies in these methods. The author claimed that most tools available, few provide information on the development, implementation, and evidence-based success (Reeve et al., 2017). Other experts agreed, finding the types of tools available to aid deprescribing lacking in explicative instruction (Poots et al., 2017; Sun et al., 2021). In addition, most researchers found research deficient on instruction, methods, or other means for deprescribing overall.

Conclusion & Chapter Summary

The existing literature revealed the necessity for an evidence-based method to deprescribe benzodiazepines as there was very little research on specifics and processes. Addressing this gap was significant as it advanced how to discontinue patient use of benzodiazepines safely. In addition, using this investigator-developed toolkit provided several improvements in knowledge and experiences with safety issues, such as alcohol and other medication use while taking benzodiazepines and determining the understanding of what all encompasses the use of benzodiazepines for both healthcare providers and patients.

Much of the existing literature presented topics on how benzodiazepines were addictive and dangerous, how providers used benzodiazepines even when alternate treatments that were safer were available, and how the recent educational changes in benzodiazepines showed the need to redirect the use of these addictive pharmaceuticals. Any expert discussion on benzodiazepines and the means for deprescribing using such means as a toolbox were missing. Stronger links have emerged from studies examining longer- rather than shorter-acting benzodiazepines, longer rather than shorter use duration, or earlier than later exposure. However, questions remain about causality and the impact of confounders on study interpretation.

Chapter 3 introduced the project design, discussing how the investigator achieved the purpose for the project, explaining the setting and sample. The investigator also included in chapter 3 a discussion on why this quality improvement project was appropriate in collecting data to answer the research questions. This chapter also presented the ethical considerations, the instrumentation used to manage the data, the data collection process, along with the data analysis.

Chapter 3

Methodology

The current project was a quality improvement using an evidence-based educational toolkit with changes in patient knowledge regarding safe benzodiazepine use measured by a pre- and post-survey. The purpose of this project was to advance patient safety and engagement through the use of this patient-centered benzodiazepine evidence-based education Toolkit (Appendix B). Chapter three discusses the project's design and the setting in which the project recruited participants. Information includes the sample of participants and how they were recruited from a specific and targeted population, the ethical considerations used to ensure participant protections throughout the project, and the instrumentation used to measure participant responses to an online survey, the data collection process, and the data analysis method.

Project Design

The current research was a quality improvement project. This type of project encourages an investigator to use an organized, systematic, and continuous action to measure specific improvement in a kind of healthcare service within a targeted patient group (Jones et al., 2019). This quality improvement project followed the U.S. Department of Health and Human Services, Health Resources and Services Administration's ([HHS]; 2019) principles for quality improvements. According to the HHS (2019), quality improvement projects operate as systems and processes, always focusing on the patient, being part of a team effort, and using the collected data to recommend changes.

Setting

The current project's setting was in a behavioral health clinic located in a medium-sized urban community in the Southeastern region of the United States. The community sits in the county seat, and the county has a population of approximately 506,707 (U.S. Census Bureau, 2021). The community's statistics show a high number of mental health patients, as approximately 17.4% of adult residents report having 14 or more poor mental health days within the past 30 days (NJ.gov, 2021). The clinic offers services to the community for mental health patients that incorporate mental wellness and how daily cognitive habits affect a patient's overall well-being, behaviors, and emotions (Gross et al., 2019). The clinic is staffed by several mental healthcare professionals, including physicians, nurse practitioners, and physician associates who have experience working within the mental health field and supporting staff.

Sample

The investigator used convenience sampling to recruit participants from a population of mental health patients and target patients at one specific behavioral health clinic. Convenience sampling is a non-probability sampling procedure that involves participant recruiting from a population of people who meet set inclusion criteria and can be conveniently located by the investigator (Qureshi, 2018). Convenience sampling is appropriate for the current project as the investigator is familiar with the clinic's staff.

The participants were selected from a target population of clinic patients who met the following inclusion criteria: a) must be a listed patient at the clinic, b) must be taking a prescribed benzodiazepine, c) must be seen at least monthly by one of the clinic's mental health professionals, d) must be willing and volunteer for participation, and e) must be 18 years of age and speak the English language. Individuals meeting the inclusion criteria were selected and

required to sign an informed consent form (Appendix A) which provided the details of the project and explained all the protections warranted to the participants involved in the project.

The investigator determined a sample of 41 patients provided the necessary results. Recruitment for these participants first required the investigator to receive signed site permission from the clinic. This permission allowed the investigator to recruit participants from the clinic. Next, the investigator informed patients of this project when they arrived for their respective scheduled appointments. Each participant received a written explanation of the project's purpose, objectives, and procedures, as explained in this proposal. An email was then sent to each participant during the session asking them to consent and take the pre-survey.

Ethical Considerations

Ethical considerations are necessary by federal law and university policy when undergoing research. The Belmont Report expresses three specific and fundamental ethical principles with their applicability to clinical trials: a) respect for persons, b) beneficence, and c) justice (U.S. Department of Health and Human Services, 1979). The three principles ensure the participants are protected by factors protecting participant rights. The investigator is responsible for safeguarding the participant's identity and mental state during the project. The current project was approved by the university's Institutional Review Board (IRB).

Additionally, the investigator required a signed informed consent from all participants and ensured all project information was understood and supported the participant's privacy. There were no potential risks to the participants. However, if any participant would have felt discomfort or chose to discontinue the survey, they were advised they could exit the survey and cease involvement with the study at any time without negative consequences.

All participants were not identified as the surveys were anonymously taken online. There were no identifying markers attached to the surveys, and the investigator had no knowledge of the participant's identity by the survey. There was no identifying information or way for the investigator to know if a participant completed the surveys or which survey results were a specific participant. Each participant selected the first initial of their mother's maiden name, the first letter of their first job, favorite color, and favorite number. All participants were encouraged to keep their codes.

The investigator also provided secure storage for all data collected. As the informed consent and the pre and post-surveys were all given online, the data were downloaded onto the investigator's laptop and placed in a password-protected folder to which only the investigator has access. When not in use, the computer was secured in a locked room or office. The data will be saved for three years and then permanently deleted from the investigator's laptop memory and hard drive.

Instrumentation

The instrumentation used for this project was a pre and post-survey developed by the investigator. Internet surveys are convenient and efficiently provided to participants with an immediate download of anonymous data available. This survey consisted of 20 questions (Appendix C) which the participants were asked to answer honestly and truthfully. The survey questions included such topics as medication knowledge and readiness to change during regular clinic appointments. At the end of the pre-survey, all participants were introduced to the Patient Education for Benzodiazepines Toolkit. After completing the toolkit education with their prescriber, they were emailed the voluntary, anonymous post-survey and requested to complete it within two weeks.

Before recruiting, the investigator completed a pilot study. Two volunteers were recruited after meeting the inclusion criteria and asked to take the survey, then provide comments on the questions' viability. A pilot study is a small-scale, preliminary means to ensure the instrumentation is valid (In, 2017). The use of a pilot study determined that the full-scale project was feasible and produced recordable results.

Data Collection

After the pilot study and recruiting process were completed, each of the 41 selected participants was provided via email with the pre-survey online URL during their scheduled appointments. To begin the pre-test survey, each participant granted consent. Then, the survey link was sent to each participant via email. These surveys took less than 10 minutes to complete, and again the investigator assured the participants of confidentiality by protecting their identity.

After all 41 participants completed the pre-survey, the investigator provided each patient the toolkit, which the investigator reviewed with patients during their respective sessions or appointments. All patients retained the toolkit for use in the future. Once completed, the participants emailed the investigator, who then emailed the post-survey URL. The participant had 14 days to complete the survey but was encouraged to take the post-test survey the same day the toolkit was explained.

The pre and post-test surveys contained 20 questions involving responses from the participants related to their knowledge and use of benzodiazepines, the medication knowledge, and examination of the participant's readiness to change during future therapy appointments. The survey questions were based on the participant's current understanding of their prescribed benzodiazepine medication. The toolkit provided comprehensive and informational education on

benzodiazepines and discussed the benefits and risks, dangers, and long-term effects of these drugs.

Data Analysis

The purpose of this project was to advance patient safety and engagement through the use of an investigative patient-centered benzodiazepine education Toolkit. The current project aimed to answer the following research questions and support the associated hypotheses.

Q1: Will education of patients on benzodiazepines using the investigator-developed toolkit improve the patient's knowledge of safe benzodiazepine use?

H10: The education of patients on benzodiazepines using the investigator-developed toolkit will not improve the patient's knowledge of safe benzodiazepine use.

H1a: The education of patients on benzodiazepines using the investigator developed toolkit will improve the patient's knowledge of safe benzodiazepine use

Q2: Will education of patients on benzodiazepines using the investigator-developed toolkit increase a patient's readiness to change by successfully weaning off after long-term benzodiazepine use?

H20: The education of patients on benzodiazepines using the investigator-developed toolkit will not increase a patient's readiness to change by successfully weaning off after long-term benzodiazepine use.

H2a: The education of patients on benzodiazepines using the investigator-developed toolkit will increase a patient's readiness to change by successfully weaning off after long-term benzodiazepine use.

The independent variable examined is the use of the educational benzodiazepine toolkit, which caused changes in the two dependent variables of increased readiness to change and

improved knowledge of benzodiazepines. The raw data were exported from the survey program and saved into an SPSS software program. The software identified the cause and effect using a multiple linear regression test.

Multiple linear regression was used to test the independent variable, use of the toolkit, and showed the dependent variables' predicted outcomes. The project's expected direct care outcome was to educate and improve the patients' knowledge of safe benzodiazepine use and increase their readiness to change by weaning and discontinuing benzodiazepines. This initial program evaluation helped clarify if the patient education benzodiazepine toolkit improved medication knowledge and willingness to change.

Summary of Methodology

Chapter three explained the methods and design used for the current project and included the data collection and analysis methods. The chapter also consisted of the introduction of the instrumentations provided to the participants. The instrumentations were in the form of online pre-and post-surveys, each used to collect the answers from the participants. Each participant was selected through convenience sampling and provided all the necessary ethical considerations to protect their human data as required by the university's IRB and stated in the Belmont Report.

As the overall purpose of the current quantitative correlational study was to assess if the independent variable causes a change in the posed dependent variables, the investigator answered the research questions and either rejected or failed to reject the null hypotheses. Chapter 4 of the proposed study continued with data collection, analysis, and presentation of the survey results.

Chapter 4

Results and Discussion

The purpose of this project was to advance patient safety and engagement through the use of a patient-centered benzodiazepine education toolkit. The project's expected direct care outcome was to educate and improve the patients' knowledge of safe benzodiazepine use and increase their readiness to change by weaning and discontinuing benzodiazepines. A sample of mental health patients at one specific behavioral health clinic was asked to respond to an online pre and post-test survey. The research questions and hypotheses that guided this project are as follows:

Q1: Will education of patients on benzodiazepines using the investigator-developed toolkit improve the patient's knowledge of safe benzodiazepine use?

Q2: Will education of patients on benzodiazepines using the investigator-developed toolkit increase a patient's readiness to change by successfully weaning off after long-term benzodiazepine use?

$H1_0$: The education of patients on benzodiazepines using the investigator-developed toolkit will not improve the patient's knowledge of safe benzodiazepine use.

$H1_a$: The education of patients on benzodiazepines using the investigator developed toolkit will improve the patient's knowledge of safe benzodiazepine use

$H2_0$: The education of patients on benzodiazepines using the investigator-developed toolkit will not increase a patient's readiness to change by successfully weaning off after long-term benzodiazepine use.

$H2_a$: The education of patients on benzodiazepines using the investigator-developed toolkit will increase a patient's readiness to change by successfully weaning off after long-term benzodiazepine use.

This chapter includes the presentation of the descriptive statistics of project variables. This chapter also presents the summary statistics and the results of the linear regression analysis conducted for this project. This chapter ends with the limitations and the summary of the results.

Results

A total of 50 participants were invited to participate. Among these, 41 participants completed the pre-test survey while 34 participants completed the post-test survey. The response rate for this project was 82%. Linear regression analyses were conducted to determine whether there is a significant increase in the patient's knowledge on safe Benzodiazepine use and the patient's readiness to change by successfully weaning off after long-term benzodiazepine use. The analyses determined that there was a significant increase in patients' knowledge on safe Benzodiazepine use. However, there was no significant increase in the patient's readiness to change by successfully weaning off after long-term benzodiazepine use.

Discussion of Results

The majority of the participants have responded that they were using Benzodiazepine because of anxiety. In the pre-test, 34 out of the 41 participants responded anxiety (82.9%), while 29 of the 34 participants responded anxiety among the posttest participants (85.3%). There were also some participants who responded that Benzodiazepine was used for panic attacks or for sleep disorders.

Table 1

Frequencies and Percentages of the Reason for Benzodiazepine Use

		Pre or Post			
		Pre		Post	
		n	%	n	%
Reason for Benzodiazepine Use	Anxiety	34	82.9	29	85.3
	Cannot breathe	1	2.4	0	0.0
	Panic attacks	1	2.4	1	2.9
	Seizures	1	2.4	1	2.9
	To make my life more manageable	1	2.4	0	0.0
	To Sleep	2	4.9	1	2.9
	To think clearly.	0	0.0	1	2.9
	Missing	1	2.4	1	2.9
Total		41	100.0	34	100.0

The patient's knowledge of safe benzodiazepine use was calculated using their responses in the survey questionnaire. The correct answer was given 1 point, while an incorrect answer was not given a point. The sum of the scores for all items was used to measure the knowledge of safe benzodiazepine use. The mean pretest score for knowledge of safe use was at 11.29 (SD = 1.68). A decrease in the mean score for knowledge of safe use was observed at the post-test (M = 10.35, SD = 1.45). For the patient's readiness to change by successfully weaning off after long-term benzodiazepine use, the responses of participants on their feeling about decreasing benzodiazepine use and their feeling about stopping benzodiazepine use were used. Based on the data gathered, the mean score on the feeling about decreasing benzodiazepine use increased from pre-test (M = 4.05, SD = 3.22) to post-test (M = 4.24, SD = 3.80). Similarly, the mean score on the feeling about stopping benzodiazepine use increased from 3.37 in the pre-test (SD = 3.39) to 3.41 in the post-test (SD = 3.44).

Table 2

Descriptive Statistics of Project Variables based on Pre and Post-test Groups

Pre or Post		Patient's knowledge of safe benzodiazepine use	Feeling about decreasing benzodiazepine use	Feeling about stopping benzodiazepine use
Pre	Mean	11.29	4.05	3.37
	N	41	41	41
	Std. Deviation	1.68	3.22	3.39
	Minimum	7.00	1.00	1.00
	Maximum	13.00	10.00	10.00
Post	Mean	10.35	4.24	3.41
	N	34	34	34
	Std. Deviation	1.45	3.80	3.44
	Minimum	6.00	1.00	1.00
	Maximum	13.00	10.00	10.00
Total	Mean	10.87	4.13	3.39
	N	75	75	75
	Std. Deviation	1.64	3.47	3.39
	Minimum	6.00	1.00	1.00
	Maximum	13.00	10.00	10.00

The dependent variables were tested for outliers to determine whether the assumption of outliers for linear regression analysis was met. Based on the boxplots presented in Figures 1, 2, and 3, an outlier for case 45 of the patient's knowledge of safe benzodiazepine use was observed. The outlier value was substituted with the minimum possible value to satisfy the outlier assumption. There was no outlier observed for the feeling about decreasing benzodiazepine use and the feeling about stopping benzodiazepine use responses.

Figure 1

Boxplots for Patient's Knowledge of Safe Benzodiazepine Use

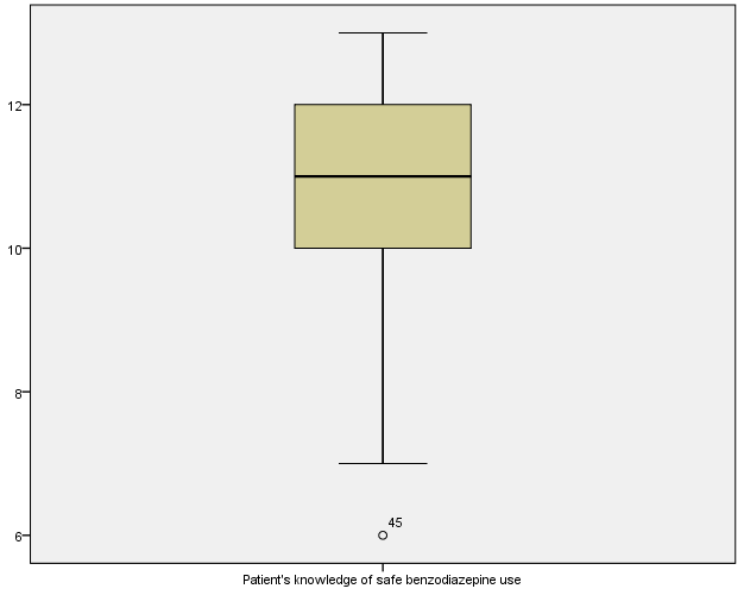
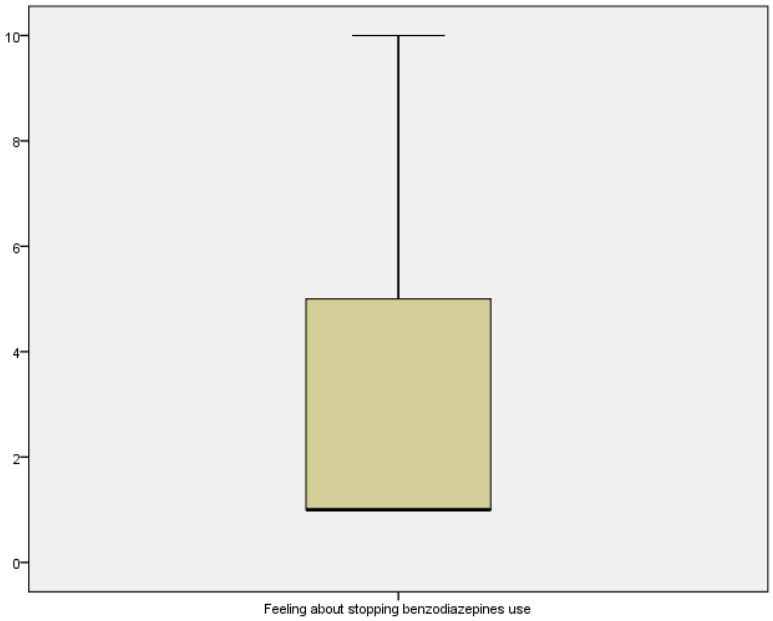


Figure 2

Boxplots for Feeling about Decreasing Benzodiazepines Use

Figure 3

Boxplots for Feeling about Stopping Benzodiazepines Use



Testing of Null Hypothesis 1

$H1_0$: The education of patients on benzodiazepines using the investigator-developed toolkit will not improve the patient's knowledge of safe benzodiazepine use.

$H1_a$: The education of patients on benzodiazepines using the investigator developed toolkit will improve the patient's knowledge of safe benzodiazepine use

A linear regression analysis was conducted to determine whether there was a significant increase in patients' knowledge of safe benzodiazepine use from pretest to posttest. The result of the regression analysis is presented in Table 3. To check the assumption of independence, the Durbin-Watson Statistic was determined at 2.151. The value of the Durbin-Watson statistic was between 1.5 to 2.5 indicating that the assumption of independence was met. Moreover, the assumption of multicollinearity was not applicable for the analysis because there is only one predictor. The result of the regression analysis determined that there is a significant change in the patient's knowledge of safe Benzodiazepine use from pre-test to post-test (B = -.910, p = .013).

Table 3

Linear Regression Analysis for Patient's Knowledge of Safe Benzodiazepine Use

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	11.293	0.241		46.766	0.000
	Pre or Post	-0.910	0.359	-0.285	-2.538	0.013

Patient's knowledge of safe benzodiazepine use; R-squared = .081; F(1,74) = 6.443, p = .013

Testing of Null Hypothesis 2

$H2_0$: The education of patients on benzodiazepines using the investigator-developed toolkit will not increase a patient's readiness to change by successfully weaning off after long-term benzodiazepine use.

$H2_a$: The education of patients on benzodiazepines using the investigator-developed toolkit will increase a patient's readiness to change by successfully weaning off after long-term benzodiazepine use.

A linear regression analysis was conducted to determine whether there was a significant increase in the feeling about decreasing Benzodiazepine use from pretest to posttest. The result of the regression analysis is presented in Table 4. To check the assumption of independence, the Durbin-Watson Statistic was determined at 2.063. The value of the Durbin-Watson statistic was between 1.5 to 2.5, indicating that the assumption of independence was met. Moreover, the assumption of multicollinearity was not applicable for the analysis because there is only one predictor. The result of the regression analysis determined that there is no significant change in the feeling about decreasing Benzodiazepine use from pre-test to post-test (B = .187, p = .819).

Table 4

Linear Regression Analysis for Feeling about Decreasing Benzodiazepine Use

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	4.049	0.546		7.416	0.000
	Pre or Post	0.187	0.811	0.027	0.230	0.819

Feeling about decreasing benzodiazepine use; R-squared = .001; F(1,74) = .053, p = .819

A linear regression analysis was conducted to determine whether there was a significant increase in the feeling about stopping Benzodiazepine use from pre-test to post-test. The result of the regression analysis is presented in Table 5. To check the assumption of independence, the Durbin-Watson Statistic was determined at 2.014. The value of the Durbin-Watson statistic was between 1.5 to 2.5 indicating that the assumption of independence was met. Moreover, the assumption of multicollinearity was not applicable for the analysis because there is only one predictor. The result of the regression analysis determined that there is no significant change in the feeling about stopping Benzodiazepine use from pretest to posttest (B = .046, p = .954).

Table 5

Linear Regression Analysis for Feeling about Stopping Benzodiazepine Use

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	3.366	0.533		6.317	0.000
	Pre or Post	0.046	0.791	0.007	0.058	0.954

Feeling about stopping benzodiazepine use; R-squared = .000; F(1,74) = .003, p = .954

Limitations

Limitations are unavoidable consequences in a project that impacts data analysis results (Ross & Bibler Zaidi, 2019). The first limitation was the sample size. Due to time constraints on

the project, the investigator sampled a limited number of 41 participants. There were only 41 participants in the pretest and 34 participants in the posttest, which limited the one-to-one correspondence to pretest and posttest data. Therefore, responses were not compared directly and were analyzed using linear regression analysis. The analysis cannot determine whether there was an increase in response scores for each participant from pre-test to post-test. Another limitation was the generalizability of the findings, which was limited due to the smaller sample size. A third limitation was the location of the study, as the participants were all from a single mental health clinic. The limitations were considered in drawing conclusions and recommendations for this project.

Summary

The purpose of this project was to advance patient safety and engagement through the use of a patient-centered benzodiazepine education toolkit. The project's expected direct care outcome was to educate and improve the patients' knowledge of safe benzodiazepine use and increase their readiness to change by weaning and discontinuing benzodiazepines. The results of the analyses determined that there was a significant increase in patients' knowledge of safe Benzodiazepine use. However, there was no significant increase in the patient's readiness to change by successfully weaning off after long-term benzodiazepine use.

Chapter 5

Summary, Conclusions, and Recommendations

This chapter will provide a discussion on the findings of this DNP project. This chapter will begin with a reiteration of the project's problem and purpose. Then, a summary of project findings will be presented. Subsequently, this chapter will discuss implications for nursing and avenues for future projects. Finally, this chapter will end with project conclusions.

Summary of Findings

The prevalence of substance abuse disorders, especially those related to opioid misuse, continues to increase within the United States. However, patients are often unengaged in treatment. They have few resources available to explain the safe use of drugs, like benzodiazepines, or what to do when wanting to decrease/cease drug use. The purpose of this project was to advance patient safety and engagement through the use of a patient-centered benzodiazepine education toolkit. A sample of 41 mental health patients at one specific behavioral health clinic was asked to respond to an online pre and post-test survey. The research questions and hypotheses that guided this project are as follows:

Q1: Will education of patients on benzodiazepines using the investigator-developed toolkit improve the patient's knowledge of safe benzodiazepine use?

Q2: Will education of patients on benzodiazepines using the investigator-developed toolkit increase a patient's readiness to change by successfully weaning off after long-term benzodiazepine use?

$H1_0$: The education of patients on benzodiazepines using the investigator-developed toolkit will not improve the patient's knowledge of safe benzodiazepine use.

$H1_a$: The education of patients on benzodiazepines using the investigator developed toolkit will improve the patient's knowledge of safe benzodiazepine use

$H2_0$: The education of patients on benzodiazepines using the investigator-developed toolkit will increase a patient's readiness to change by successfully weaning off after long-term benzodiazepine use.

$H2_a$: The education of patients on benzodiazepines using the investigator-developed toolkit will increase a patient's readiness to change by successfully weaning off after long-term benzodiazepine use.

The project's expected direct care outcome was to educate and improve the patients' knowledge of safe benzodiazepine use and increase their readiness to change by weaning and discontinuing benzodiazepines. The results of the linear regression analyses determined that there was a significant increase in patients' knowledge on safe Benzodiazepine use when comparing pre-test and post-test scores. Thus, the toolkit appeared to be helpful in engaging patients in their respective care and teaching patients how to more carefully engage in benzodiazepine use and possible side effects of benzodiazepine use.

However, when considering the second project question, the results were not statistically significant. There was no significant increase in the patient's readiness to change by successfully weaning off after long-term benzodiazepine use. Thus, even with the help of the patient-centered toolkit, patients did not demonstrate statistically significant changes in wanting to decrease benzodiazepine use nor stop benzodiazepine use altogether.

Implications for Nursing

Findings for both project questions have implications for nursing practice. First, when considering the overall results of this project, patients demonstrated increased knowledge of

benzodiazepine use, demonstrating that the toolkit was easy to navigate and understand. Thus, integrating a patient-centered toolkit focused on benzodiazepine use may continue to be helpful to patients prescribed benzodiazepines as part of treatment. In addition, healthcare providers may be encouraged to provide and discuss this toolkit with patients or adopt similar toolkits to increase awareness of proper drug usage and willingness to change.

The first project question was established to answer whether participation in the patient-centered toolkit increased knowledge of safe benzodiazepine use. Although the sample for this study was relatively small (N = 41), findings demonstrate that patients' education on safe benzodiazepine usage was significantly improved after using the toolkit. Therefore, mental health care professionals, nurses, and other healthcare administrators may benefit from implementing this toolkit or a similar toolkit to improve patient knowledge on benzodiazepine use before or during treatment with benzodiazepines. Further, healthcare professionals may benefit from implementing similar toolkits regarding opioid drugs as part of patient treatment plans.

When considering the second project question, the toolkit did not facilitate statistically significant changes in patients' willingness to change by either decreasing or ceasing the use of benzodiazepines. Although findings were not significant, mental health professionals, nurses, and medical professionals may find this information helpful in informing future initiatives to decrease or stop benzodiazepine use among patients. With the understanding that the information in the toolkit did not produce changes in willingness to cease or reduce benzodiazepine use, future initiatives could bolster information and focus more on these aspects within future toolkits. Additionally, healthcare providers may benefit by implementing strategies in conjunction with the toolkit to try and increase patients' willingness to change.

Recommendations for Further Project

Overall, the patient-centered toolkit was beneficial in improving patients' knowledge regarding safe usage of benzodiazepines. Although the results of this project are promising, findings do indicate areas where future investigators may want to focus. First, a future investigator could replicate this study to include more information on decreasing and ceasing the use of benzodiazepines. Additionally, the replicated study could ask questions regarding which aspects were most helpful/least helpful to participants to bolster the efficacy of the toolkit.

Future investigators may also want to include a matched-pair design, in which the investigator can compare a participant's pre-test and post-test scores. This way, the investigator may learn the degree to which each participant found the toolkit useful. This may help develop more targeted toolkits in the future.

Another avenue for future investigators is to replicate this study with a different sample. Future investigators may want to use an increased sample size. This way, the reliability of test results can be tested. In addition, the investigator might find it beneficial to sample from multiple mental health clinics or from various settings to test the toolkit among a more heterogeneous sample. Finally, future investigators may want to keep track of participants' demographics to see differences in toolkit efficacy when demographics are considered. Keeping track of patient demographics may allow for more targeted toolkits for different genders, ethnicities, or ages to be created in the future.

These avenues for future investigation may help develop and refine patient-centered interventions focused on safe benzodiazepine usage or the willingness to decrease or cease participation in benzodiazepine use. As the opioid crisis continues to impact the well-being of thousands adversely, innovative treatment options are imperative. The findings of this project

should be used to inform current practice and guide future investigators in finding practical and effective solutions to combat unsafe or unnecessary benzodiazepine use.

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Appendix A: Informed Consent

Edinboro University of Pennsylvania

CONSENT TO PARTICIPATE IN RESEARCH STUDY

Also available online at this link
https://tinyurl.com/cwvrj7wv

Title of Study: Advancing patient safety and engagement through the use of a patient-centered benzodiazepine education tool kit

Principal Investigator: Larson
Co-Investigator(s): Theodora Nwosu, PMHNP-BC

KEY INFORMATION

You are being asked by Dr. Meg Larson, DNP, FNP, and Theodora Nwosu to participate in a research study; taking part in the study is voluntary, and you may stop at any time.

The purpose of the study is to develop an evidence-based patient education Toolkit to enhance patients' knowledge about the safe use of Benzodiazepines and the risks of chronic benzodiazepine use.

In this study, you will be asked to voluntarily participate in an online pre/post survey about your use of your medication, Benzodiazepine. It will take you about ten minutes to complete the study.

There are no potential risks during the study.
Participants can improve their knowledge about the safe use of Benzodiazepines.

There are no direct benefits to participants from the research. It will help researchers better understand how this research relates to their profession.

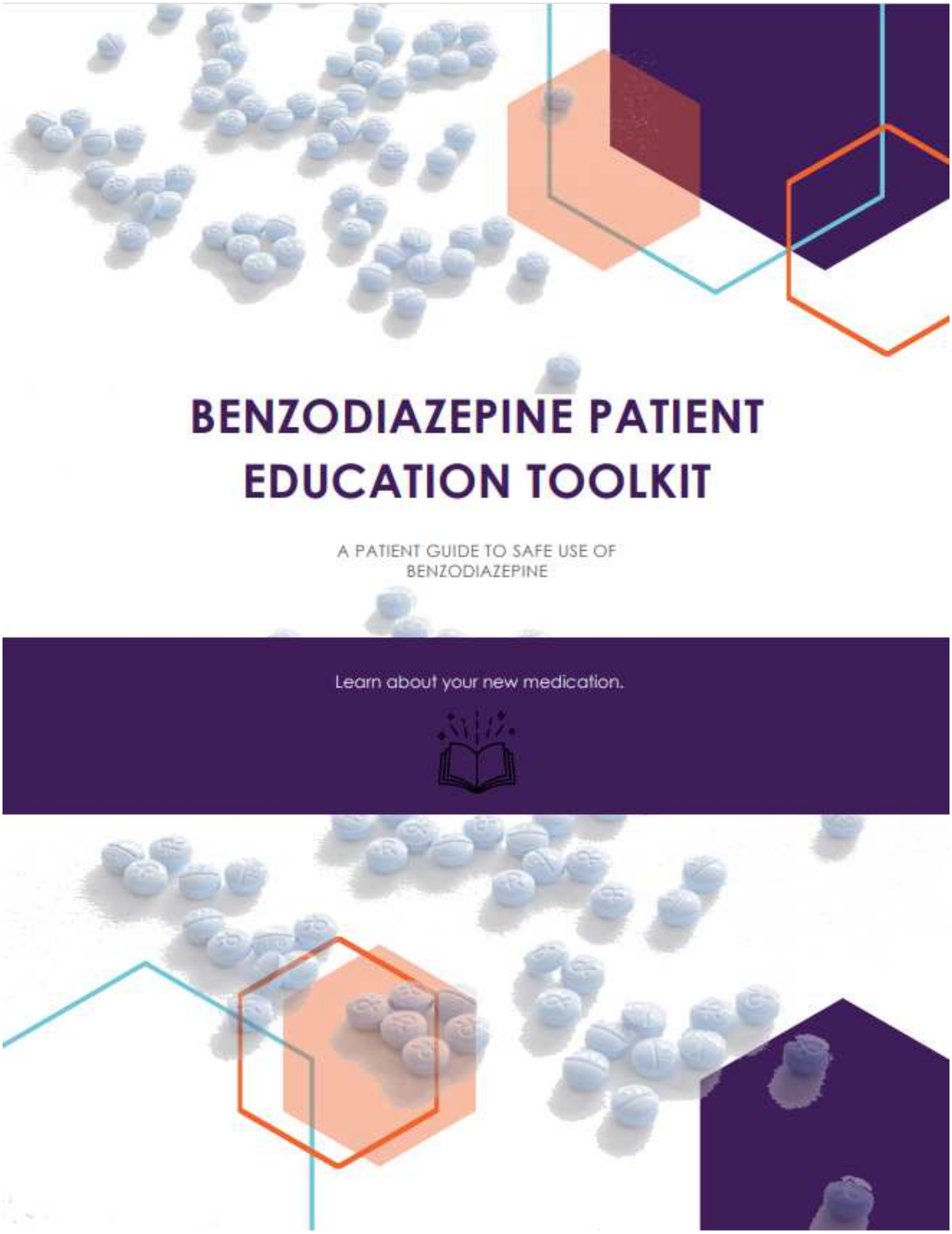
The online study is completely anonymous; you will not be asked to give any information that could identify you (e.g., name). The survey is NOT linked to IP addresses. Any information provided to obtain extra credit will NOT be connected to your responses to the survey. Individual responses will not be presented, just the aggregated data.

Online Consent 1
Rev 2/2019

CONSENT TO PARTICIPATE IN RESEARCH STUDY

Remember, taking part in this study is voluntary. If, while taking the survey, you feel uncomfortable or no longer want to participate, you may stop at any time. To stop taking the survey, you may submit where you ended by going to the last page. Or you can decide

Appendix B: Evidence-Based Educational Toolkit



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BENZODIAZEPINE PATIENT EDUCATION TOOLKIT

A PATIENT GUIDE TO SAFE USE OF BENZODIAZEPINE

WHAT ARE BENZODIAZEPINES?

Benzodiazepines (ben-zo-di-az-eh-peens) are sedatives sometimes called benzos. A sedative is a medicine taken to calm a person down. Patients can take benzodiazepines as a pill or injection, although injections are rare. Patients should not take them for over four weeks due to difficulties associated with withdrawal. Patients should always store benzodiazepines in a safe area and never share them with others.

WHY ARE BENZODIAZEPINES PRESCRIBED?

Your mental health provider may prescribe benzodiazepines to treat anxiety when presenting symptoms of increased worry, nervousness, and stress or to treat sleep problems. Your provider may also use this medication to treat other serious health problems, such as seizures or alcohol withdrawal.

WHAT ARE THE DIFFERENT TYPES OF BENZODIAZEPINES?

Your mental health provider may prescribe any of the following medications to help with anxiety or sleep issues. Many types are not listed here.

Generic name	Brand name	Treatments
Alprazolam	Xanax	Anxiety
Clonazepam	Klonopin	Anxiety
Diazepam	Valium	Anxiety/Sleep
Lorazepam	Ativan	Anxiety
Temazepam	Restoril	Sleep

BENZODIAZEPINE SIDE EFFECTS

1. FEELING TIRED
2. FEELING DIZZY (LOSING YOUR BALANCE)
3. HEADACHES
4. CONFUSION (NOT BEING ABLE TO THINK AND ACT WELL)
5. NO EMOTIONS
6. LOW AWARENESS LEVELS
7. MUSCLE WEAKNESS
8. TREMORS (SHAKES)
9. MEMORY LOSS (TROUBLE REMEMBERING THINGS)
10. DEPRESSION (FEELING UNHAPPY, SAD, OR HOPELESS)
11. INSOMNIA (TROUBLE SLEEPING)

DEFINING SIDE EFFECTS

Some side effects may occur from taking benzodiazepines, but not everyone will present with side effects. Short-term side effects will end in about a week to two weeks after stopping the medication. Long-term effects may last longer if on the medication for increased periods of time.

SERIOUS RISKS

Brain changes

Frequent accidents

Frequent falls and fractures in the elderly

Tolerance

- Body gets used to medicine
- May feel need for more medicine
- May feel medicine is no longer working

Addiction (craving medicine, even when body does not need it)

Overdose (too much medication in the body)

Hallucination (hearing or seeing things that are not there)

Delusion (beliefs do not match reality)

Death

BENZODIAZEPINES AND YOU

CAN MY BENZODIAZEPINES AFFECT OTHER MEDICATIONS?

Benzodiazepines can interact with other medications. Serious side effects, like death, can happen when you take benzodiazepines with medications, such as opioids and street drugs. Different medicines, such as the ones used to treat mental illnesses, can also cause serious side effects.

Let your healthcare providers know about your treatment with benzodiazepines to avoid serious complications.

WILL DRINKING ALCOHOL INTERACT WITH BENZODIAZEPINES?

Do not take alcohol with your benzodiazepine. This medication interacts badly with alcohol, causing excess sedation (for example, you will feel too sleepy, tired, or drowsy to function properly).

CAN I DRIVE WHILE TAKING BENZODIAZEPINES?

Benzodiazepine can affect the way you drive. You should not drive if your medicine affects your mind or makes you feel too sleepy or tired to pay attention to the road properly.

Talk to your mental health prescriber to check if you are safe to drive while taking benzodiazepines.

BENZODIAZEPINES AND PREGNANCY

Benzodiazepine can influence an unborn child. After the child is born, the medication can pass through breast milk. You should avoid taking this medication if you plan to breastfeed your child.

Talk to your healthcare providers (OBGYN & mental health prescriber) before continuing this medication if you are pregnant. They can guide you through safely stopping the medication to avoid any complications.

BENZODIAZEPINE SAFE AND APPROPRIATE USE

Benzodiazepines are controlled substance medication(s). The government has strict rules about taking this medicine.

1. Do not take more than the amount of medicine prescribed.
2. Do not take longer than prescriber has advised.
3. Always store in a secure and safe place.
4. Do not share with anyone else.
5. Do not drive if affecting your mind or making you feel too sleepy or tired.
6. Do not take alcohol with your benzodiazepine.

Benzodiazepine can interact with other medications. Let your health care providers know about your treatment with Benzodiazepines.

WHAT IF I WANT TO STOP TAKING MY BENZODIAZEPINE?

Do not stop taking your medicine without first speaking to your mental health prescriber.

You can become very sick if you do, possibly experiencing adverse withdrawal side effects because your body is used to taking the medication. You will need to be slowly taken off the medication. Your prescriber will have to guide weaning you from the medication based on the length of time you have been on benzodiazepines and the amount of the drug taken. They will ensure you come off the medication safely and properly.

BENZODIAZEPINE WITHDRAWAL

Withdrawal refers to how the body reacts when lowering the amount of medicine taken for a long time. Withdrawal also refers to the body's changes in reaction to stopping benzodiazepine after taking it for a long time.

You can have serious withdrawal symptoms, including seizures, if you do not first consult your healthcare provider.

COMMON SYMPTOMS OF WITHDRAWAL

There are medications to help you get through the withdrawal symptoms. Talk to your mental health prescriber for support.

INDIVIDUALIZED SAFE AND SUPPORTIVE WEAN OFF

You and your mental health prescriber will discuss a plan best for you.

During the wean-off, you will receive support through therapy and medication management.

It may take weeks to wean off your medication.

Some people may take longer than others to wean off safely.

Your mental health provider and the type of support you have can help you cope during the wean-off period.

Talk to your mental health prescriber about your own needs.

CONTACTS FOR MENTAL HEALTH QUESTIONS

Do not feel alone. Call your mental health provider if you think you have become addicted or take more than your prescribed Benzodiazepine.

For mental health crisis, call 911 or 1800-273- TALK (8255) to reach a 24- hour helpline, text MHA TO 741741, or go to your nearest emergency room.

Here are some additional phone numbers/websites to contact or refer to for help with your mental health:

1. Substance Abuse and Mental Health Services Administration (SAMHSA)
   National Helpline
   1-800-662-HELP (4357) or 1-800-487-4889 (TDD, for hearing impaired)

2. Behavioral Health Treatment Services Locator (search by address, city, or ZIP Code)
   https://findtreatment.samhsa.gov/

3. Poisoning
   https://www.cdc.gov/homeandrecreationalsafety/poisoning

4. CDC Guideline for Prescribing Opioids for Chronic Pain
   https://www.cdc.gov/mmwr/volumes/65/rr/pdfs/rr6501e1.pdf

5. Learn 2 Cope is for families with loved ones who have a substance use disorder:
   https://www.learn2cope.org/.

6. CDC Drug Overdose Guide
   https://www.cdc.gov/drugoverdose/epidemic

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Appendix C: Pre and Post Survey Questions

1. Do you grant consent to participate?

2. What is the name of the benzodiazepines you are taking? (do not worry about your spelling!)

3. Why are you taking the medication? (What is the goal)

4. The most severe risks in taking benzodiazepines include: (check all that apply)

    a. Permanent brain changes
    b. Frequency of accidents including motor vehicle
    c. Frequency of falls
    d. Addiction
    e. Overdose
    f. Death
    g. All of the above

5. What are some other serious side effects of taking benzodiazepines (choose all that apply)?

    a. Feeling tired or sleepy
    b. Feeling dizzy
    c. Headaches
    d. Confusion, memory loss
    e. No emotions
    f. Low awareness
    g. Muscle weakness
    h. Tremor/Shakes
    i. Depression
    j. Insomnia/Trouble sleeping
    k. All of the above

6. Please choose the correct statements about the use of benzodiazepines

    a. Taking street drugs will greatly increase your risk of being hurt or overdosing
    b. You should share information on all prescribed and street drugs with your prescriber
    c. Taking more medications than you have been prescribed can make you addicted or dependent on Benzodiazepines
    d. Benzodiazepines are often prescribed to be taken as needed. This means that you should only take your Benzodiazepine when you are feeling stressed, anxious, and are unable to stop or control your worries.

e. All of the above

7. What should you do about the side effects?

    a. Stop the medicine
    b. Call your prescriber
    c. Seek emergency care if serious
    d. All of the above

8. Can you drive safely when you are feeling drowsy or notice the effects of your Benzodiazepine?

    a. Yes
    b. No

9. Can you safely drink alcohol with this medicine?
    a. Yes
    b. No

10. When you are prescribed a new pain pill or sedative medicine you should discuss it with your benzodiazepine prescriber before starting it.

    a. True
    b. False

11. Can you share this medication with other people that you think may need it?

    a. Yes
    b. No

12. How should you store your benzodiazepines medication (choose all that apply)

    a. Cool Dry Spot
    b. Secure area
    c. Where not one will accidently see it
    d. With a child safety lid
    e. In the bottle it comes in (With your prescription information)

13. How do you refill this medicine? (Check any that apply)

    a. Call at least 7 days before the refill is needed
    b. Keep or reschedule all appointments with your mental health prescriber

14. Please choose true statements about benzodiazepines.

    a. Benzodiazepines are often prescribed to be taken as needed. This means that you should only take your Benzodiazepine when you are feeling stressed, anxious, and are unable to stop or control your worries.
    b. It is acceptable to adjust your own dose of Benzodiazepine
    c. You should never share your Benzodiazepine
    d. All of the above

15. You should inform your prescriber immediately if you are pregnant, think you may be pregnant or are breastfeeding.

    a. True
    b. False

16. I have been given crisis numbers and contacts and know how to get emergency help

    a. True
    b. False

17. My prescriber can work with me to develop a plan to safely and comfortably wean off my benzodiazepines

    a. Yes
    b. No
    c. Maybe

18. How long are you supposed to take the medication?

19. On a scale of 1 to 10 starts how do you feel about decreasing your benzodiazepines use?

20. On a scale of 1 to 10 starts how do you feel about stopping your benzodiazepines use?